

B. COST-EFFECTIVENESS ANALYSIS GUIDE

Developing a cost effectiveness analysis requires identifying key project cost drivers. This guide provides in-depth instructions on conducting a cost-effectiveness analysis and directions for using the CEA template. It includes instructions on how to establish, value and evaluate various projects and alternatives.

Be sure to attach the following documents to the Capital Investment Proposal Criteria portion of the application:

Document	Directions
Cost-Effectiveness Analysis	Print/Attach a copy of the summary page of the Cost Effectiveness Template to the application and use the data derived from the CEA template to complete financial tables
Supporting Data and Calculations	Print/Attach all data sources and calculations as an attachment to the application.

Cost-Effectiveness Theory

Cost-effectiveness is a useful economic method for evaluating competing alternatives. OMB Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, defines cost-effectiveness as:

A systematic quantitative method for comparing the costs of alternative means of achieving the same stream of benefits or a given objective.

VA uses this method for its Capital Investment Methodology to determine if, on the basis of a life-cycle cost analysis of competing alternatives, a selected project has the lowest cost for a given amount of benefits. Cost-effectiveness analysis evaluates the total life-cycle costs per project, then compares it against other viable project alternatives. This analysis produces a selection criterion by which an investment decision can be determined.

Cost-Effectiveness Process

Cost-effectiveness analysis is one portion of the total VA decision-making process. It is located within the major criterion: Financial Priorities. This analysis evaluates cost-effectiveness, alternatives, cost savings/avoidance, risk, and exit strategy. Together, these analyses determine the best investment option available that meets the benefits required by the proposal's goals and mission, and those of VA.

Cost-effectiveness analysis is a two-step process. The first step is to collect and analyze significant cost data to determine the costs of achieving the benefit or objective under each alternative. This is a very important step in the process since all calculations and impending decisions will be based upon the quality of the data collected. Cost data collection can be done by utilizing VA data source information, project appraisals, and historic figures, among others. Any figures utilized in the process, however, need to be substantiated. Proper documentation ensures the validity of the proposal and should be included as appendices to the proposal. After all the cost data have been determined, figures are inputted into the CEA template, provided by VA. This template is designed to ensure consistency within the proposal submission process. The CEA template should include cost data for each alternative considered.

The second step consists of comparing the costs of all alternatives. This fiscal analysis is a very important part of the capital investment process in that it produces the best financial analysis to assist in determining which of the project alternatives to propose for funding. If all alternatives have been evaluated on an even playing field, this step should result in identifying the alternative that achieves the intended objective at the least cost to VA. This information is then summarized in the Alternatives Analysis template, to assist in determining the best available project option that meets the stated objectives.

Getting Started on the Template

The template included for use in calculating cost effectiveness is in a Microsoft Excel format. It will run on any Pentium-based processor, but a speed of 233MHz or higher is strongly recommended. Other minimum system requirements for use include:

- 64MB RAM Memory (96MB+ are strongly recommended)
- Windows 95 or above
- 10MB Hard Drive Space allocated to program
- CD ROM Drive (if loading from CD) or
- Internet Browser with Intranet Access (if downloading from internal web site)

If downloading the file from the Intranet, it will be downloaded in a self-extracting zipped format. Instructions for downloading and opening the file are below. If loading or copying from a CD, proceed to the section "Starting the Template".

Unzipping the Template

From the designated location, download the zipped file to your computer. Once downloaded, double-click with your left mouse button to begin the self-extraction process. You will see a message box appear prompting you for the location to which you would like to store the file. Select the appropriate directory and press the “Unzip” button on the right of the message box. You should see the Progress Bar unzipping the MS Excel file (ends in .xls) and a prompt that 1 file has been unzipped successfully. Close the message box. The Excel file is now stored in the selected directory ready for use.

Starting the Template

Open the file named “CEA Template.xls”. Since the file is approximately 7.4MB in size, it may be necessary for you to close other open applications depending upon the amount of RAM you have available. The large size is due to the underlying complexity of the calculations in conjunction with Visual Basic programming. *Please note that it may take a minute or more to open the file if your computer system does not meet the requirements.*

When the file opens, it will automatically take you to a start screen similar to the one shown below. **Be sure to “Enable Macros”**.

Step 1: Enter the Project Name in the designated box at the top left of the screen,

Step 2: Enter the Project Number in the designated box at the top left of the screen. These will automatically be generated on each successive screen. *Please note that the number you enter will be replaced with a number provided by the CIO/VACIP, which will remain through the life-cycle of the asset.*

Project Title

Project Number

- Facilities
- Medical & Non-Medical Equipment (Non-IT)
- Information Technology Acquisition
- Energy Savings Performance Contract (ESPC)
- Enhanced Use Lease
- Sharing Agreement

Select

Please Select The Type Of Project For Which You Want To Perform A Cost Effectiveness Analysis

Clear All Worksheets

View Summary Sheet

Fiscal Year Cycle: 2002

Current Discount Rate: 7.00%

Current Inflation Rate: 3.00%

Note: Use of the CEA Guide is necessary to complete this template

Step 3: Input the fiscal year cycle for which you are performing the analysis. This information should go in the designated light blue box near the bottom left of your screen.

Step 4: Be sure that the correct year has been inputted into the Fiscal Year Cycle box. (The default is set for 2005)

Step 5: Below the Fiscal Year Cycle box are boxes to input the current Discount Rate and Current Inflation Rate. They are defaulted to the most current rates. These rates transfer throughout each worksheet automatically, and all calculations will reflect the number that has been inputted into these boxes.

Step 6: Finally, select the button marked “Clear All Worksheets” if you are beginning a new analysis. This will clear any existing numbers and calculations throughout the workbook. However, if you have previously saved your analysis and are revisiting the template, do not select this button. All previously saved work will be lost. If this occurs, simply close the file without saving and restart the template.

Creating a Proposal

Depending upon the type of investment you are analyzing, select the option button corresponding to that category and press the select button. (See special instructions for Enhanced-Use Lease and Enhanced Sharing Agreement categories in this manual.) When you press the select button, a new pre-formatted sheet will appear.

For each alternative, there are 8 sections to be completed:

- 1) Previous Year(s) Expenditures (Any expenditures pre-dating the fiscal year cycle.)
- 2) Acquisition Costs
- 3) Acquisition Savings
- 4) FTE Savings (during acquisition)
- 5) Recurring Costs
- 6) Recurring Savings
- 7) FTE Savings (recurring)
- 8) Residual Value

All sections are to be completed in current dollar amounts with the exception of FTE Savings, which are calculated as the number of FTEs saved during each corresponding year.

Completing the Costs, Savings, & Residual Value Sections

This template is not a means of determining cost and savings data. These data must be researched and coordinated prior to insertion into the template. Once the costs and savings have been categorized, they are ready for insertion.

All work is entered in current dollars on the “Current” worksheets only – the Inflated and Discounted worksheets are generated automatically.

By category, input the values in the lightest blue cells (light aqua) corresponding to the appropriate category. DO NOT attempt to input information into any other colored cell. All other colored cells are self-generating. When inputting values on this worksheet, input the costs in current dollars, *as if you had to make the purchase today*. That is, even if the cost occurs in Year 10 for 100 PCs, input the cost of 100 PCs if you purchased them today. This is also true for savings. Calculate all savings as if they were presently incurred. For example, if by purchasing a new piece of medical equipment, you can perform the service with one less technician, the present salary of the eliminated FTE would appear as a savings under *Personnel and Compensation* for the anticipated life of the machine. Finally, the same procedure will be used for Residual Value. If you plan to sell the aforementioned machine after 10 years, you should estimate the current market value of a 10-year-old machine with specifications similar to the new one. This value will be inputted under Year 10 of the Residual Value section. You must complete the necessary information for each alternative under consideration.

Remember, as you complete the “Current” worksheet for the investment category, other information is automatically generated. A sheet of “Discounted” information is created to compare one alternative against another in “real” dollars. This “discounted” value will be of most importance to the analyst when comparing alternatives since it accounts for varying dates of expenditure. Secondly, a sheet of “Inflated” information is generated. This is to assist the analyst when budgeting for the full lifecycle of costs. While engineering services may cost approximately \$1.5 million today for a specific type of renovation, they will certainly be more expensive in 15 years when your new hospital is scheduled for its first renovation. This sheet will assist you with estimating future budgets.

Also, remember to match financial and economic life of the asset. If you expect to use the asset for 10 years, then conduct the financial analysis through the 10th year and, if applicable, input the residual value at the 11th year and discount back (see Updates to the Guide #2, on page 4 of the *Guide*).

Across the top of each sheet will appear a series of buttons to navigate the workbook. These buttons will select the worksheets described above. Additionally, the “Current” worksheets will each contain a *Clear* button applicable to clearing only the worksheet you are in.

Once you have completed the applicable sections, you may view other worksheets or return to the Start sheet where you can move to the Summary sheet.

Special Instructions for Enhanced-Use Leases and Enhanced Sharing Agreements

When you select either an Enhanced-Use Lease (EU) or Enhanced Sharing Agreement (ESA) category of investment, the worksheet will require additional information. Each of these categories will allow for just one alternative to be completed. This should be completed just as described above. Additionally, sources of revenue associated with these options must be calculated. Below the cost and savings section, there is a section where revenue information can be inserted.

In the far-left column titled *Additional Sources of Revenue*, identify the source of revenue. In the lightest blue columns to the right, input the annual revenue stream as if it were realized today (i.e., use current dollars). For example, if by leasing two floors of a new hospital to an outside contractor you gain annual revenue of \$2 million for each of the next five years, you will input \$2M into the corresponding revenue cells for the next five years.

Often, you will want to consider other alternatives against an EU or SA category. Simply return to the Start sheet, and select the appropriate category for an additional alternative evaluation. The direct comparisons will appear on the Summary sheet.

Viewing and Comparing Results

At the top of each alternative section on each worksheet, a summary of associated costs, savings, revenues and residual values will appear. This is useful to analyze the alternative, however all alternatives should also be considered against one another.

Return to the Start sheet. In the lower right-hand corner is a button that can direct you to the Summary sheet. Here you can view the results of each alternative as *Current*, *Net Present*, and *Inflated* values in Base Values and Total Values. The Total Values of Alternatives is the sum of the Base Values of Alternatives and Previous Year(s) Expenditures. This page is self-generating and should not be altered. If Enhanced-Use or Enhanced Sharing investments were considered, they will appear at the end of each of the other categories for easier comparison.